REMARKS

The Office rejected Claims 1-7 of the present application under the judicially created doctrine of obviousness-type double patenting in view of the claims of U.S. Application No. 10/629,550. Because the obviousness-type double patenting rejection is a provisional rejection, Applicants request the Office hold the rejection in abeyance pending issuance of the patent in the present case. Upon issuance of a patent in the present case, Applicants request the Office raise the matter of double-patenting in the 10/629,550 application.

Present independent Claim 1 is drawn to a polymer solid electrolyte type fuel cell. The fuel cell of present Claim 1 includes an ion exchange membrane, a fuel electrode, an oxidizer electrode, an internal electrode and a voltage application device. The voltage application device may apply a voltage to the internal electrode of the claimed fuel cell.

The voltage application device of the presently claimed invention can control the potential of the internal electrode of the claimed fuel cell. The voltage application device may be used to reduce a current flowing to an internal electrode and thereby reduce excess oxygen (see the sentence bridging pages 11 and 12). The voltage application device may also be used to oxidize fuel that is present in fuel cell (e.g., hydrogen (see the paragraph bridging pages 13 and 14 of the specification)) due to permeation into an ion exchange membrane.

When too much of oxidizer (O_2) is present, the voltage application device functions to reduce oxygen to water and thereby avoid the production of hydrogen peroxide.

$$O_2 + 4H^+ + 4e^- \rightarrow 2H_2O$$

The voltage application device may also function to oxidize fuel to form protons according to the following reaction.

$$H_2 \rightarrow 2H^+ + 2e^-$$

Thus, the fuel cell of the claimed invention is one that is able to effectively deal with excess oxygen (e.g., oxidizer) by turning the oxidizer into water thereby avoiding the formation of peroxide-type species which may otherwise decompose to form radical species.

Applicants submit that the fuel cell of present independent Claim 1 is not anticipated by JP 58-176879 (JP '879) at least because JP '879 does not disclose an ion exchange membrane, a voltage application device, and an internal electrode having the functionality of the presently claimed fuel cell. Although one of the JP '879 electrodes may be able to measure the potential difference between the electrodes of the prior art solid oxide fuel cell, it is not described as one that is able to control the potential of an internal electrode, in contrast to the functionality of the voltage application device of present Claim 1.

Applicants submit that the rejection of the present claims as anticipated by JP '879 is not supportable and should be withdrawn because the fuel cell of amended independent Claim 1 is different from the solid oxide fuel cell of the JP '879 publication.

The Office rejected previously presented Claims 1-6 as anticipated in view of a patent to Miller (U.S. 6,756,141). Miller discloses a fuel cell that includes an anode electrode, a cathode electrode, a different electrode, a catalyzed membrane and a voltage applications means. The Office cited column 3, lines 1-5 of Miller as support for stating that Miller discloses a fuel cell wherein the electrolyte is an ion exchange membrane (see page 4 of the Office Action of March 20, 2006). This disclosure of Miller is reproduced below for convenience:

> ... the polymer electrolyte membrane fuel cell (PEMFC), typically includes at least four different material structures (i.e., polymeric membrane, a noble metal catalyst, a cellulosic gas diffusion structure, and metallic collector plates) all of which must be combined intimately with each other and, thus, constitute a complex network of heterogeneous interfaces.

No ion exchange membrane and/or ionomer membrane is disclosed at column 3, lines 1-5 of Miller. Applicants submit that the Office's assertion that Miller discloses the ion exchange resin of the present invention at column 3, lines 1-5 is not correct.

The Office rejected Claims 7 and 8 in view of both JP '879 and Miller by stating that the prior art discloses a fuel cell applying a voltage to an internal electrode and thus the prior art discloses a step which is capable of suppressing the generation of radicals in the prior art fuel cells. Applicants submit the Office has not provided any rational basis for making this assertion. Applicants seasonably traverse the Office's assertion that the suppressing of the present claims is inherently produced in the prior art electrodes cited by the Office.

Independent Claim 1 further requires that at least one internal electrode is provided "in the ion exchange membrane." Applicants submit that neither the JP '879 or Miller prior art disclose an embodiment in which the internal electrode is provided in an ion exchange membrane. Applicants thus submit that the subject matter of the present independent claims is further patentable over the prior art, e.g., the prior art does not disclose a polymer solid electrolyte fuel cell wherein a fuel electrode is on one side of an ion exchange membrane, an internal electrode is inside the ion exchange membrane, and an oxidizer electrode is on the other side of the ion exchange membrane.

New dependent Claim 10 states that both the fuel electrode and the oxidizer electrode are in direct contact with the ion exchange membrane.

For the reasons discussed above, Applicants submit present independent Claims 1 and 7 are novel and not obvious in view of the prior art of record and respectfully request allowance of all now-pending claims.

Respectfully submitted,

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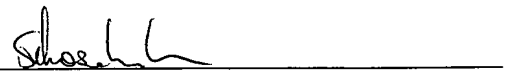

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